

Time : 3 Hrs.

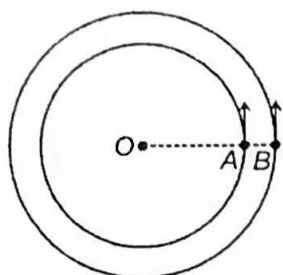
TEST - 2

MM : 720

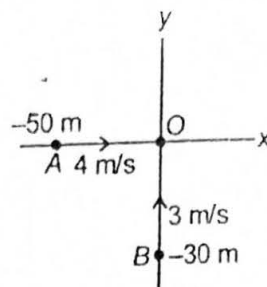
[PHYSICS]

Choose the correct answer :

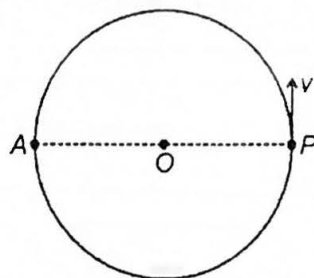
1. Two particles A and B are executing uniform circular motion on concentric and coplanar paths as shown in figure. Time period of revolution of A and B are 4 s and 4.5 s respectively. At $t = 0$ they are on same line as shown. The time at which A will pass B again is



- (1) 9 s (2) 18 s
(3) 27 s (4) 36 s
2. When a ball is projected with speed $40\sqrt{2}$ m/s at an angle of 45° with horizontal, its vertical velocity after first bounce becomes half that of vertical velocity at the time of projection. The horizontal range after first bounce is
- (1) 40 m
(2) 160 m
(3) 80 m
(4) 100 m
3. Two particles A and B are positioned as shown in figure. If A and B start simultaneously towards origin with respective velocities 4 m/s and 3 m/s, then closest distance between them is



- (1) 10 m
(2) 8 m
(3) 6 m
(4) 12 m
4. A particle P is moving on a circular path centred at O as shown in figure. O and A are two observers observing the particle P. If angular velocity of P at this instant w.r.t O is ω , then angular velocity of P w.r.t A at the same instant is



- (1) ω (2) $\frac{\omega}{2}$
(3) 2ω (4) $\frac{\omega}{3}$

Space for Rough Work



5. A particle starts moving from rest on a circular path of radius 100 m with constant rate of change of speed 1 m/s^2 . Acceleration of the particle at $t = 10 \text{ s}$ is
- (1) 1 m/s^2 (2) 2 m/s^2
 (3) $\sqrt{3} \text{ m/s}^2$ (4) $\sqrt{2} \text{ m/s}^2$
6. A particle is thrown up with 40 m/s at an angle 30° with horizontal from the top of a tower of height 60 m . Horizontal range of the particle is ($g = 10 \text{ m/s}^2$)
- (1) $30\sqrt{3} \text{ m}$ (2) 120 m
 (3) 60 m (4) $120\sqrt{3} \text{ m}$
7. Your friend is moving with speed v due east and you are moving with same speed due north. Velocity of your friend as seen by you is
- (1) $v\sqrt{2}$ North-East (2) v North-East
 (3) $v\sqrt{2}$ South-East (4) v South-East
8. A body of mass 2 kg is projected at angle of 30° with horizontal and speed 20 m/s from ground. The magnitude of change in velocity during total time of flight is ($g = 10 \text{ m/s}^2$)
- (1) 10 m/s (2) 40 m/s
 (3) 20 m/s (4) 30 m/s
9. Two vectors have magnitudes 8 N and 16 N . Which of the following is not possible for magnitude of their resultant vector?
- (1) 6 N (2) 20 N
 (3) 15 N (4) 9 N
10. A particle is moving on a circular path of radius $\frac{20}{\pi} \text{ m}$. If the particle starts from rest and its speed varies with time t as $v = 2t \text{ m/s}$, then time taken to complete two revolutions is
- (1) $2\sqrt{5} \text{ s}$ (2) $2\sqrt{3} \text{ s}$
 (3) $4\sqrt{5} \text{ s}$ (4) $4\sqrt{3} \text{ s}$
11. A particle is at position $(6\hat{i} + 10\hat{j}) \text{ m}$ at rest. It starts moving with acceleration $(4\hat{i} - 5\hat{j}) \text{ m/s}^2$. At what time it will cross the x -axis?
- (1) 4 s (2) 1 s
 (3) 2 s (4) 5 s
12. A ball is projected at an angle 60° with horizontal at initial velocity 20 m/s . The speed of particle when velocity makes an angle 45° with horizontal is nearly
- (1) 10 m/s
 (2) 14 m/s
 (3) 7 m/s
 (4) 16 m/s
13. A person A is in a vehicle moving at a constant speed in horizontal straight line. He throws a ball vertically upward with respect to vehicle. Another person B is standing on the road. Which of the following is correct regarding path of the ball?
- (1) Both A and B will observe straight line path
 (2) A will observe straight line and B will observe parabolic path
 (3) Both A and B will observe parabolic path
 (4) A will observe parabolic path and B will observe straight line path
14. A fighter plane is flying horizontally at speed 120 km/minute at height of 8 km . The horizontal distance of fighter plane from target from where it should release a bomb to hit the target is
- (1) 80 km (2) 40 km
 (3) 8 km (4) 4 km

Space for Rough Work

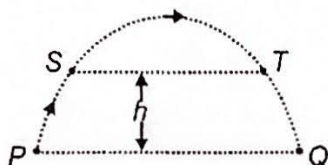
15. A particle is thrown horizontally with 20 m/s from the top of a tower of height 20 m ($g = 10 \text{ m/s}^2$). Angle with horizontal at which it will hit the ground is

(1) 30° (2) 60°
(3) 53° (4) 45°

16. Two vectors have sum of their magnitude 36 unit. Their vector sum has magnitude 24 unit and resultant vector is perpendicular to smaller vector. Magnitudes of these two vectors are

(1) 20, 16 (2) 22, 14
(3) 26, 10 (4) 27, 9

17. An oblique projectile projected from ground takes time 4 s to travel from P to Q while takes 2 s to travel from S to T. Height h of level ST from level PQ is



(1) 10 m (2) 15 m
(3) 12.5 m (4) 8.5 m

18. A vector $\vec{A} = 2\hat{i} + 3\hat{j} + 6\hat{k}$ makes an angle of β with positive direction of x-axis. β is equal to

(1) $\tan^{-1} \frac{2}{7}$ (2) $\sin^{-1} \frac{2}{7}$
(3) $\cos^{-1} \frac{2}{7}$ (4) $\cos^{-1} \frac{4}{7}$

19. A particle moves under gravity such that at any time t the vertical and horizontal position from projection point are given as $y = (10t - 5t^2)$ and $x = 10\sqrt{3}t$ respectively. Then angle of projection with horizontal is

(1) 60° (2) 30°
(3) 45° (4) 75°

20. A particle is located at position $(3\hat{i} + 4\hat{j})\text{m}$ and starts from rest under acceleration $(2\hat{i} - \hat{j})\text{ms}^{-2}$, then at what time its position will be $(19\hat{i} - 4\hat{j})\text{m}$?

(1) 2 s (2) $\frac{1}{2}$ s
(3) 4 s (4) 5 s

21. A ball is projected at an angle 45° with horizontal from a point on ground 10 m away from a vertical wall. It just crosses the wall to land on the ground at a distance 40 m from the wall on other side. Then the height of the wall is

(1) 4 m (2) 8 m
(3) 10 m (4) 20 m

22. A particle is projected from suitable height from ground with velocity $\vec{u} = (8\hat{i} + 6\hat{j})\text{m/s}$. Take y-axis along vertical and x-axis along horizontal. At what time velocity is perpendicular to initial velocity? ($g = 10 \text{ m/s}^2$)

(1) 0.2 s (2) $\frac{3}{7}$ s
(3) $\frac{5}{3}$ s (4) $\frac{1}{9}$ s

23. A particle is moving with constant speed over circle $x^2 + y^2 = 50$, with speed $\sqrt{10} \text{ m/s}$. Acceleration of the particle, when it is at point (5, 5) is (in m/s^2)

(1) $\hat{i} - \hat{j}$ (2) $-\hat{i} - \hat{j}$
(3) $\frac{1}{\sqrt{2}}\hat{i} - \frac{1}{\sqrt{2}}\hat{j}$ (4) $\frac{-1}{\sqrt{2}}\hat{i} - \frac{1}{\sqrt{2}}\hat{j}$

Space for Rough Work



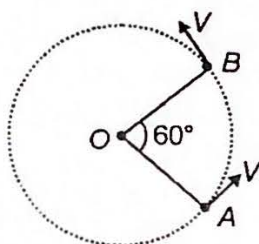
24. In uniform circular motion for a particle if \vec{r} , \vec{a} and \vec{v} are respectively radius vector, acceleration and velocity of particle, then which one is constant? [Where ω is angular velocity]

- (1) $\vec{r} \times \vec{v}$ (2) $\vec{a} \times \vec{v}$
 (3) $|\vec{\omega} \times \vec{v}|$ (4) All of these

25. A particle moves with constant angular acceleration k over circular path starting from rest. If radius of circle is unit then time at which tangential and radial acceleration both are equal in magnitude is

- (1) k (2) \sqrt{k}
 (3) $\frac{1}{\sqrt{k}}$ (4) $k^{3/2}$

26. Two particles A and B are moving over circle such that angle at centre $\angle AOB$ remains 60° . If speed of each \vec{A} and \vec{B} is V , then relative velocity of A with respect to B is



- (1) $V\sqrt{3}$ (2) V
 (3) $V\sqrt{2}$ (4) $V\frac{\sqrt{3}}{2}$

27. Resultant \vec{R} of two vectors \vec{A} and \vec{B} is normal to \vec{A} and its magnitude is same as \vec{A} . Angle between \vec{A} and \vec{B} is

- (1) 135° (2) 45°
 (3) 90° (4) 37°

28. In circular motion, acceleration is given by tangential component a_1 and radial component a_2 , then which of the following is correct?

- (1) Both a_1 and a_2 are rate of change of speed
 (2) a_2 only gives rate of change of speed
 (3) a_1 only gives rate of change of speed
 (4) Both a_1 and a_2 change direction of motion

29. Which of the following quantities is a vector quantity?

- (1) Pressure (2) Moment of inertia
 (3) Current density (4) Finite angle

30. Two forces \vec{A} and \vec{B} are acting at a point. If \vec{A} is reversed, the new resultant becomes perpendicular to the initial resultant. Then

- (1) \vec{A} and \vec{B} are of different magnitudes and at an angle 120°
 (2) $|\vec{A}| = |\vec{B}|$ and are not collinear
 (3) $|\vec{A}| = |\vec{B}|$ and are collinear
 (4) \vec{A} and \vec{B} are of different magnitudes but at an angle 60°

31. There is a vector given $\vec{A} = (3\hat{i} + 4\hat{j})$ by rotating about tail in $x-y$ plane so that it becomes $\vec{B} = 4\hat{i} + 3\hat{j}$, then which is correct?

- (1) Should be rotated 16° anticlockwise
 (2) Should be rotated 37° clockwise
 (3) Should be rotated 16° clockwise
 (4) Should be rotated 53° clockwise

Space for Rough Work



32. A particle is projected with velocity u at angle θ_1 with horizontal. The ratio of range and maximum height is 4. When it is projected at angle θ_2 with horizontal with same speed, the ratio of range and maximum height is 2. Then $\frac{\tan\theta_1}{\tan\theta_2}$ will be equal to
- (1) 4 (2) 2
(3) $\frac{1}{2}$ (4) $\frac{1}{4}$
33. Two particles projected from ground towards each other with velocities 40 m/s and $20\sqrt{2}$ m/s at angles 30° and 45° with horizontal respectively. Separation between projection points is 108 m. Both collide after time (Given: $\sqrt{3} = 1.7$)
- (1) 4 s (2) 3 s
(3) 2 s (4) 1 s
34. A vehicle is accelerating from rest at rate of 2 m/s^2 in straight line. At that instant particle is projected vertically upward with respect to vehicle at 40 m/s. The distance of point where particle hits the ground from vehicle at the time of reaching the ground is
- (1) 40 m (2) 20 m
(3) 64 m (4) 32 m
35. Two particles A and B are projected at angles 30° and 45° with horizontal at respective velocities 20 m/s and $10\sqrt{2}$ m/s, then acceleration of A with respect to B will be
- (1) Zero (2) $-g$
(3) $-2g$ (4) $-\frac{g}{2}$
36. A particle has position $\vec{s} = 2t\hat{i} + (10 - 4t^2)\hat{j}$, then path of the particle is
- (1) Circular (2) Elliptical
(3) Parabolic (4) Straight line
37. A body is projected from ground for maximum horizontal range, then ratio of radii of curvature at the point of projection and highest point is
- (1) 1 : 1 (2) $2\sqrt{2} : 1$
(3) $1 : \sqrt{2}$ (4) 2 : 1
38. A ball is at same height after time t_1 and t_2 from point of projection in ground to ground projectile motion, then the height of the point from ground is
- (1) $\frac{1}{2}g(t_1 + t_2)^2$ (2) $\frac{1}{2}gt_1t_2$
(3) $\frac{1}{4}g(t_1 + t_2)^2$ (4) $\frac{1}{4}gt_1t_2$
39. A ball is projected at an angle of 60° with initial velocity u . The range on the horizontal ground is 100 m. If velocity of projection is increased by 20% in second projection at same angle with horizontal, then horizontal range is
- (1) 120 m (2) 144 m
(3) 140 m (4) 169 m
40. Two particles A and B are thrown from ground with velocities \vec{u}_A and \vec{u}_B respectively. Air resistance is neglected. If a graph is plotted by taking their relative position along x-axis and time along y-axis, nature of graph for the duration they are in air is
- (1) Parabola
(2) Straight line
(3) Ellipse
(4) Hyperbola

Space for Rough Work



41. A car is moving along East with 20 m/s. A bus is moving along 60° North of East at same speed. Velocity of car w.r.t the bus is
- 20 m/s 60° North of East
 - 20 m/s 60° South of East
 - 20 m/s due East
 - 20 m/s due North
42. Rain is falling at angle of 45° east of vertical. A person moving due east at 10 m/s observes rainfall vertically downward. Then speed of raindrops w.r.t ground is
- $10\sqrt{3}$ m/s
 - $10\sqrt{2}$ m/s
 - $5\sqrt{3}$ m/s
 - 5 m/s
43. A person swims along the flow of river through distance x in time t_1 and return back in time t_2 . The time in which he will swim the same distance in still water will be

$$(1) t_1 + t_2 \quad (2) t_2 - t_1$$

$$(3) \frac{t_1 t_2}{t_1 + t_2} \quad (4) \frac{2t_1 t_2}{t_1 + t_2}$$

44. A steamer can cross 100 m wide river in a time of 10 s along the shortest path. If river current speed is 10 m/s, then shortest time to cross the river is

$$(1) 5 \text{ s} \quad (2) 5\sqrt{2} \text{ s}$$

$$(3) 10\sqrt{2} \text{ s} \quad (4) 4 \text{ s}$$

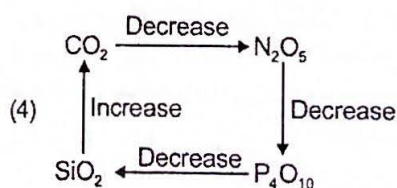
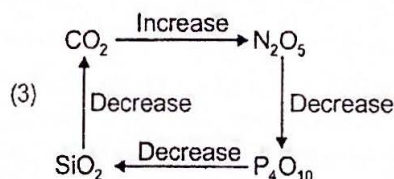
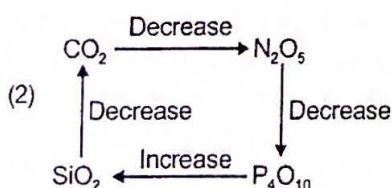
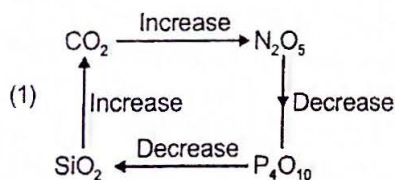
45. Water current in a river from east to west has speed of 4 m/s. A boat starts moving at 10 m/s from south bank to reach north bank. If boat started at 30° with current, the drift of boat in crossing 40 m wide river is nearly

$$(1) 20\sqrt{3} \text{ m} \quad (2) 20 \text{ m}$$

$$(3) 100 \text{ m} \quad (4) 50 \text{ m}$$

[CHEMISTRY]

46. Select correct diagram about acidic strength of oxides



Space for Rough Work



47. In modern periodic table, both metals and non-metals are present in
 (1) p-block (2) d-block
 (3) 1st group (4) f-block
48. The correct order of 1st ionization potential of Li, Be, B and C is
 (1) C > Be > B > Li (2) C > B > Be > Li
 (3) C > B > Li > Be (4) B > C > Be > Li
49. Which of the following group of modern periodic table has maximum number of elements?
 (1) 1st group (2) 3rd group
 (3) 10th group (4) 18th group
50. Which one of these is a group 18 element?
 (1) [Xe]6s²
 (2) [Xe]4f¹⁴5d¹6s²
 (3) [Ar]3d¹⁰4s²4p⁶
 (4) [Ar]3d⁷4s²
51. Negative enthalpy change is not possible for which of the following changes?
 (1) $X_{(g)}^{3+} \rightarrow X_{(g)}^{2+}$ (2) $X_{(g)}^{2+} \rightarrow X_{(g)}^{+}$
 (3) $X_{(g)} \rightarrow X_{(g)}^{-}$ (4) $X_{(g)}^{-} \rightarrow X_{(g)}^{2-}$
52. Observe IP₁, IP₂, IP₃ and IP₄ for element A, B, C and D. Identify which element has 3 electrons in outermost shell (all values are in kJ/mole)?
 (1) 786, 1577, 3231, 4355 (for A)
 (2) 737, 1450, 7732, 10540 (for B)
 (3) 495, 4562, 6912, 9544 (for C)
 (4) 800, 2427, 3659, 25025 (for D)
53. Which of the following has the highest screening effect for last electron?
 (1) Fluorine (F) (2) Oxygen (O)
 (3) Carbon (C) (4) Nitrogen (N)
54. A neutral atom Ar is converted to Ar³⁺ by the following process :

$$Ar(g) \xrightarrow[-e]{E_1} Ar^{+}(g) \xrightarrow[-e]{E_2} Ar^{2+}(g) \xrightarrow[-e]{E_3} Ar^{3+}(g)$$

 The correct order of E₁, E₂ and E₃ energies are
 (1) E₁ < E₂ < E₃ (2) E₁ > E₂ > E₃
 (3) E₁ = E₂ = E₃ (4) E₁ > E₂ < E₃
55. The electron affinity values for the halogens show the following trends
 (1) F < Cl > Br > I (2) F < Cl < Br < I
 (3) F > Cl > Br > I (4) F < Cl > Br < I
56. The X—X bond length is 1.00 Å and C—C bond length is 1.54 Å. The C—X bond length is likely to be
 (1) 0.80 Å (2) 1.18 Å
 (3) 1.57 Å (4) 1.68 Å
57. In the following electronic configuration;
 $ns^2(n-1)d^0-2(n-2)f^0-14$
 If (n - 1) = 6, the configuration will be of
 (1) Lanthanides (2) d-Block
 (3) Actinides (4) s-Block
58. Be and Mg have positive electron gain enthalpy (or, zero value of electron affinity) because
 (1) Be and Mg have [He]2s² and [Ne]3s² configuration respectively. Hence, extra electron will be added in vacant p-subshell
 (2) 2s and 3s orbitals are half filled to their capacity
 (3) Be and Mg are electronegative elements
 (4) Be and Mg have large radii
59. The ionic radii of isoelectronic species N³⁻, O²⁻ and F⁻ are respectively given by
 (1) 1.36, 1.40, 1.71 (2) 1.36, 1.71, 1.40
 (3) 1.71, 1.40, 1.36 (4) 1.71, 1.36, 1.40

Space for Rough Work



60. Mulliken scale of electronegativity uses the concept of
- Electron affinity and electronegativity of Pauling
 - Electron affinity and atomic size
 - Electron affinity and ionisation potential
 - Electron affinity and bond energy
61. Which among the following statements is/are correct?
- ψ^2 represents the atomic orbitals
 - The number of peaks in radial probability distribution is $(n - 1)$
 - Radial probability density $\rho_{nl}(r) = 4\pi r^2 R_{nl}^2(r)$
 - A node is a point in space where the wave function (ψ) has zero amplitude
- a only
 - a & b
 - a, b & c
 - a, b, c & d
62. A dye absorbs a photon of wavelength λ and re-emits the same energy into two photons of wavelengths λ_1 and λ_2 respectively. The wavelength λ is related to λ_1 and λ_2 as
- $\lambda = \frac{\lambda_1 \lambda_2}{(\lambda_1 + \lambda_2)^2}$
 - $\lambda = \frac{\lambda_1 + \lambda_2}{\lambda_1 \lambda_2}$
 - $\lambda = \frac{\lambda_1 \lambda_2}{\lambda_1 + \lambda_2}$
 - $\lambda = \frac{\lambda_1^2 \lambda_2^2}{\lambda_1 + \lambda_2}$
63. Which of the following orbitals has 2 nodal planes?
- $2p_x$
 - $2p_y$
 - $3d_{x^2-y^2}$
 - $2p_z$
64. If the kinetic energy of a particle is doubled, de-Broglie wavelength becomes
- 2 times
 - 4 times
 - $\sqrt{2}$ times
 - $\frac{1}{\sqrt{2}}$ times
65. If uncertainty in position and momentum are equal then uncertainty in velocity is
- $\sqrt{\frac{h}{\pi}}$
 - $\sqrt{\frac{h}{2\pi}}$
 - $\frac{1}{2m} \sqrt{\frac{h}{\pi}}$
 - $\frac{1}{m} \sqrt{\frac{h}{\pi}}$
66. What are the values of the orbital angular momentum of an electron in the orbitals 1s, 3s, 3d and 2p?
- 0, 0, $\sqrt{6}h$, $\sqrt{2}h$
 - 1, 1, $\sqrt{4}h$, $\sqrt{2}h$
 - 0, 1, $\sqrt{6}h$, $\sqrt{3}h$
 - 0, 0, $\sqrt{20}h$, $\sqrt{6}h$
67. In which of the following pairs, probability of finding the electron in xy plane is zero for both orbitals?
- $3d_{yz}$, $4d_{x^2-y^2}$
 - $2p_z$, $4d_z^2$
 - $4d_{zx}$, $3p_z$
 - $3d_{zx}$, $4d_{xy}$
68. The value of $(n + l + m)$ for electron in the ground state of H-atom is
- 2
 - 1
 - 4
 - 3
69. According to Rutherford, size of nucleus is in the order of
- 10^{-5} Å
 - 10^{-13} Å
 - 10^{-15} Å
 - 10^{-8} Å
70. If wavelength of the first line of the Balmer series of hydrogen atom is 656.1 nm, then wavelength of the second line of this series would be
- 218.7 nm
 - 328 nm
 - 486 nm
 - 640 nm

Space for Rough Work



71. Threshold frequency of a metal is f_0 . When light of frequency $\nu = 2f_0$ is incident on the metal plate, maximum velocity of electron emitted is v_1 . When frequency of incident radiation is $5f_0$, maximum velocity of emitted electron is v_2 . Then $\frac{v_1}{v_2}$ shall be

- (1) 1 : 4 (2) 1 : 2
(3) 2 : 1 (4) 3 : 1

72. In iron atom, how many electrons have quantum numbers $n = 3$ and $l = 2$?

- (1) 2 (2) 4
(3) 6 (4) 8

73. The orbital diagram in which both Pauli's exclusion principle and Hund's rule are violated

- (1)

↑↓	↑↑	↑	
----	----	---	--

(2)

↑↓	↑↓		↑↓
----	----	--	----

(3)

↑↑	↑	↑	↑
----	---	---	---

(4)

↑↓	↑↓	↑↓	↑
----	----	----	---

74. Which of the following statements is correct about node?

- (1) Number of angular nodes = $n - l - 1$
(2) Number of radial nodes = l
(3) Total number of nodes = $n - 1$
(4) Number of nodal planes in $d_{z^2} = 2$

75. Which of the following set of quantum numbers is impossible for an electron in an atom?

- (1) $n = 1, l = 0, m = 0, s = +\frac{1}{2}$
(2) $n = 9, l = 7, m = -6, s = -\frac{1}{2}$

(3) $n = 2, l = 1, m = 0, s = +\frac{1}{2}$

(4) $n = 3, l = 2, m = -3, s = +\frac{1}{2}$

76. Pauli's exclusion principle states that

- (1) Nucleus of an atom contains no negative charge
(2) Electrons move in circular orbits around the nucleus
(3) Electrons occupy orbitals of lowest energy
(4) All the four quantum numbers of two electrons in an atom cannot be same

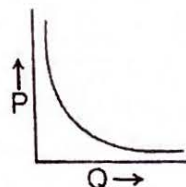
77. The concept of orbital is a result of

- (1) Schrodinger's wave equation
(2) Bohr's atomic model
(3) Photoelectric effect
(4) Sommerfeld's atomic model

78. If an electron is travelling with the speed of 200 m/s within 1 m/s uncertainty, what is the theoretical uncertainty in its position (in μm) (μm : micrometer)?

- (1) 14.5 (2) 29
(3) 58 (4) 114

79. Consider the graph given below:



P & Q can be (as per Bohr's model)

- (1) $P = \text{Energy}$; $Q = \text{Principal quantum number}$
(2) $P = \text{Radius}$; $Q = \text{Number of protons}$
(3) $P = \text{Velocity}$; $Q = \text{Square of principal quantum number}$
(4) $P = \text{Energy}$; $Q = \text{Number of protons}$

Space for Rough Work



80. Which of the following has the largest de-Broglie wavelength (all have equal velocity)?
(1) CO_2 molecule (2) NH_3 molecule
(3) Electron (4) Proton
81. Splitting of spectral lines under the influence of magnetic field is called
(1) Zeeman effect (2) Stark effect
(3) Photoelectric effect (4) Moment of inertia
82. A hydrogen atom in the ground state is excited by monochromatic radiation of wavelength λ Å. The resulting spectrum consists of maximum 15 different lines. What is the wavelength (λ) of radiation?
(Given : $R_H = 109737 \text{ cm}^{-1}$)
(1) 937.3 Å (2) 1025 Å
(3) 1236 Å (4) 2000 Å
83. Line spectra is characteristic of
(1) Molecules (2) Atoms
(3) Radicals (4) Compounds
84. If the ionisation energy of He^+ is $19.6 \times 10^{-18} \text{ J}$ per atom then the energy of Be^{3+} ion in the second stationary state is
(1) $-4.9 \times 10^{-18} \text{ J}$ (2) $-44.1 \times 10^{-18} \text{ J}$
(3) $-11.025 \times 10^{-18} \text{ J}$ (4) $-19.6 \times 10^{-18} \text{ J}$
85. Number of waves produced by an electron in one complete revolution in n^{th} orbit is
(1) n (2) n^2
(3) $(n + 1)$ (4) $(2n + 1)$
86. Velocity of an electron in Hydrogen atom (in ground state) is equal to
(1) $\frac{1}{274}$ times of speed of light
(2) $\frac{1}{256}$ times of speed of light
(3) $\frac{1}{179}$ times of speed of light
(4) $\frac{1}{137}$ times of speed of light
87. An electron in an atom jumps in such a way that its kinetic energy changes from x to $\frac{x}{4}$. The change in potential energy will be
(1) $\frac{3}{2}x$ (2) $-\frac{3}{8}x$
(3) $\frac{3}{4}x$ (4) $-\frac{3}{4}x$
88. On the basis of Bohr's model, the radius of the 3rd orbit for H atom is
(1) Equal to radius of first orbit
(2) Three times the radius of first orbit
(3) Five times the radius of first orbit
(4) Nine times the radius of first orbit
89. Bohr's atomic model could not explain
(i) Zeeman & Stark effect
(ii) Spectrum of multielectronic species
(iii) Transition of electron in H-atom
(1) (i) & (iii)
(2) (i), (ii) & (iii)
(3) Only (i)
(4) (i) & (ii)
90. The ratio of specific charge of a proton and an α -particle is
(1) 2 : 1
(2) 1 : 2
(3) 1 : 4
(4) 1 : 1

Space for Rough Work

[BIOLOGY]

91. All viruses
- Contain protein
 - Contain DNA
 - Are susceptible to antibiotics
 - Are intracellular parasites
- Choose **correct** option
- (1) (a) & (d) (2) (b) & (c)
 - (3) (a) & (b) (4) (b) & (d)
92. Which one is the **wrong** pairing for the disease and its causal organism?
- (1) White rust of crucifers – *Albugo candida*
 - (2) Black rust of wheat – *Puccinia graminis*
 - (3) Loose smut of wheat – *Ustilago nuda*
 - (4) Early blight of potato – *Phytophthora infestans*
93. Protein particles that cause diseases by misfolding other proteins are
- (1) Virusoid (2) Prions
 - (3) Satellite RNA (4) Capsid
94. Potato spindle tuber disease causing organism is different from HIV as the former
- (1) Contains RNA (2) Has no capsid
 - (3) Has only protein (4) Both (1) & (3)
95. Mycorrhiza exhibits the phenomenon of
- (1) Commensalism (2) Mutualism
 - (3) Competition (4) Antagonism
96. VAM
- (1) Forms fungal sheath around root
 - (2) Fungal hypha grows intracellularly
 - (3) Fungal hypha destroys cortical cells to reach phloem of the plant
 - (4) Forms hartig net in the intercellular spaces of cortex

97. Select the **correct** option and fill up the blanks in the following statements.

- The (I) reproduce by asexual spores called conidia but conidia as well as fruiting bodies are found in (II).
- Lichens are very good (III) indicators.
- The most notorious organism is (IV) that causes malaria which has a staggering effect on human population.

	(I)	(II)	(III)	(IV)
(1)	Deuteromycetes	Basidiomycetes	Water pollution	<i>Plasmodium</i>
(2)	Phycomycetes	Ascomycetes	Water pollution	<i>Entamoeba</i>
(3)	Deuteromycetes	Basidiomycetes	Air pollution	<i>Entamoeba</i>
(4)	Deuteromycetes	Ascomycetes	Air pollution	<i>Plasmodium</i>

98. Body of lichen consists of two dissimilar organisms. Choose the **correct** option w.r.t. component which form bulk of the thallus
- Autotrophic component
 - Prepare food for fungi
 - Form sexual reproductive structures
 - Provide shelter & absorb mineral nutrients
 - Mostly belongs to ascomycetes or sometimes basidiomycetes
- (1) Five (2) Two
 - (3) Three (4) One

Space for Rough Work



99. Choose the **correct** option w.r.t. phagic reproduction

- (1) Prophage is not formed
- (2) Nucleic acid enters host cell
- (3) Envelope enters host
- (4) Shown by HIV

100. _____ crystallised the TMV and found it to be largely composed of _____.

- (1) Ivanowsky, RNA
- (2) Beijerinck, DNA
- (3) Twort, protein
- (4) Stanley, protein

101. Structurally complete mature and infectious virus is called

- (1) Viroid
- (2) Virion
- (3) Virusoid
- (4) Prion

102. Read the given statements & select an option stating which ones are **true (T)** or **false (F)**.

- a. Chrysophytes are microscopic & float passively in water currents.
- b. The pigments of euglenoids & flagellated protozoans are identical to those present in higher plants.
- c. In ciliated protozoans, the co-ordinated movement of rows of cilia causes the water laden with food to be steered into the gullet.
- d. In general, viruses that infect animals have either single or double stranded RNA or double stranded DNA.

a b c d

- (1) T T T T
- (2) F F T T
- (3) T F T T
- (4) T T F T

103. How many of the following symptoms/diseases are caused by viruses?

Tetanus, Mumps, Cholera, Influenza, Citrus canker, Leaf rolling & curling, Typhoid, Herpes, Yellowing & vein clearing.

- (1) Five
- (2) Eight
- (3) Six
- (4) Four

* 104. How many of following fungi have medicinal importance for humans?

Amanita phalloides, *Monascus purpureus*, *Penicillium chrysogenum*, *Trichoderma polysporum*, *Gibberella fujikuroi*, *Bacillus licheniformis*.

- (1) Two
- (2) Three
- (3) Four
- (4) Five

105. Viruses

- (1) Have metabolic machinery to generate ATP
- (2) Lack genetic material for replication
- (3) Are inert outside their specific host cell
- (4) Always have specialised protein coat covered by an envelope

106. Read the following statements :

- (a) Karyochorisis does not involve breakage of nuclear membrane
- (b) Unicisternal golgi bodies
- (c) Constitute a unique kingdom of heterotrophic organisms
- (d) No motile cells in the life cycle

Choose correct option w.r.t. fungi

- (1) (a) & (d)
- (2) (b) & (d)
- (3) (c) & (d)
- (4) (a), (b) & (c)

Space for Rough Work

107. Fungal bodies in which entire cell gets transformed into reproductive structures are known as

- (1) Holocarpic (2) Eucarpic
(3) Monocentric (4) Polycentric

108. Gametangia formation is absent but sexual reproduction is present in

- (1) *Mucor* (2) *Alternaria*
(3) *Rhizopus* (4) *Agaricus*

109. Match the following columns.

- | | |
|--------------------|----------------------------|
| a. Imperfect fungi | (i) <i>Claviceps</i> |
| b. Club fungi | (ii) <i>Alternaria</i> |
| c. Sac fungi | (iii) <i>Saccharomyces</i> |
| | (iv) Puffballs |
| | (v) <i>Aspergillus</i> |
| | (vi) <i>Trichoderma</i> |
| | (vii) Bracket fungi |

(1) a(ii, vii), b(iv, v), c(i, iii, vi)

(2) a(i, iii, vi), b(iv, v), c(ii, vii)

(3) a(i, ii, iii), b(iv, v), c(vi, vii)

(4) a(ii, vi), b(iv, vii), c(i, iii, v)

110. Site of karyogamy and meiosis in sac fungi is

- (1) Ascus mother cell
(2) Ascospore
(3) Ascus
(4) Ascocarp

111. Asexual & sexual spores found in fungi respectively are

- (1) Conidia & zoospores
(2) Oospores & ascospores
(3) Sporangiospores & basidiospores
(4) Ascospores & basidiospores

112. Members of fungi

- (a) Show chemoautotrophy
(b) Store glycogen
(c) Possess sterol in membranes
(d) Are mainly aquatic

Choose **incorrect** statement(s)

- (1) (b) & (c) (2) (a) & (d)
(3) (a), (c) & (d) (4) All are incorrect

113. A model organism used for the genetic analysis is

- (1) Pink bread mould (2) Black bread mould
(3) Water mould (4) Green mould

114. The synthetic class deuteromycetes is composed of asexual stages of fungi, some of them have affinities to

- (1) Phycomycetes (2) Oomycetes
(3) Zygomycetes (4) Ascomycetes

115. Choose the **odd** one w.r.t. fungal group

- (1) Truffles
(2) Morels
(3) *Drosophila* of plant kingdom
(4) Toadstools

116. **Correctly** match the Column-I & Column-II w.r.t. members of slime moulds

Column-I

Column-II

- | | |
|----------------------------|----------------------------|
| a. Asexual reproduction | (i) Binary fission |
| b. Sexual reproduction | (ii) Spore formation |
| c. Vegetative reproduction | (iii) Fusion of myxamoebae |

(1) a(i), b(ii), c(iii)

(2) a(iii), b(ii), c(i)

(3) a(ii), b(iii), c(i)

(4) a(i), b(iii), c(ii)

Space for Rough Work



117. Haploid phase → Iso-gametangia → Thick walled Zygote → Meiosis → Spore

Above given life cycle pattern is shown by

- (1) Button mushroom (2) Bread mould
(3) Puff ball (4) Bracket fungi

118. Choose the incorrect option

Class	Perfect spores	Imperfect spores
(1) Egg fungi	Oospore	Zoospores
(2) Club fungi	Basidiospores	Uredospores
(3) Conjugation fungi	Zygospore	Planospores
(4) Sac fungi	Ascospores	Conidia

119. Chemical composition of cell wall is of taxonomic significance in fungi. N-acetylglucosamine is solely present in the cell wall of

- (1) *Albugo* (2) *Synchytrium*
(3) *Rhizopus* (4) *Phytophthora*

120. Mycelium of higher fungi is

- (1) Branched and aseptate
(2) Branched and septate
(3) Coenocytic and unbranched
(4) Septate and unbranched

121. Sleeping sickness is caused by

- (1) *Paramoecium* (2) *Leishmania*
(3) *Trypanosoma* (4) *Entamoeba*

122. Chrysophyta includes

- (1) Golden algae and armoured protists
(2) Diatoms and desmids
(3) Spindle organisms and diatoms
(4) Desmids and whirling whips

123. Protozoans are divided into four groups mainly on the basis of

- (1) Pigmentation
(2) Reproduction
(3) Cell wall composition
(4) Locomotory structures

124. Select a wrong set

Protists	Organ	Feature
(1) Diatoms	Cell wall	Embedded with silica
(2) Dinoflagellates	Flagella	Lie longitudinally only
(3) Euglenoids	Pellicle	Make their body flexible
(4) Slime moulds	Plasmodium	Bears spores at tips

125. "Though they are photosynthetic in presence of sunlight, when deprived of sunlight they behave like heterotrophs by preying on other smaller organisms". This statement is related to

- (1) Desmids
(2) Red dinoflagellates
(3) Euglenoids
(4) Slime moulds

126. Members of protista

- (a) Are microscopic organisms
(b) May have plastids
(c) Are mostly aquatic
(d) Possess 70 S cytoplasmic ribosomes

Choose the correct option

- (1) (a), (b) & (c) (2) (b), (c) & (d)
(3) (a), (b) & (d) (4) (c) & (d)

Space for Rough Work

127. Choose the **incorrect** match

- (1) Ciliated protozoans - Actively moving organisms
- (2) Marine amoeboid protozoans - Siliceous skeleton
- (3) Sporozoans - Malarial parasite
- (4) Flagellated protozoans - Free living organisms only

128. *Euglena* shows/possesses

- (1) Two flagella
- (2) Longitudinal meiotic cell division
- (3) Reserve food material is paramylon
- (4) Both (1) & (3)

129. How many of the given below features are associated with members of chrysophyta?

- (a) Chief 'producers' in the oceans
- (b) Shows photoautotrophic nutrition
- (c) Zygote develops into an auxospore
- (d) Form gritty soil
- (e) Diatoms may be pennate type or centric type depending upon the symmetry

- (1) Three (2) Five
- (3) Four (4) Two

130. How many of the following statements are **correct** regarding the class basidiomycetes?

- a. Clamp connections occur between adjacent cells
- b. Primary mycelium is well developed and elaborate
- c. Secondary mycelium develops fruiting bodies, called basidiocarps
- d. Some members produce multinucleate gametes called coenogametes
- e. Sexual reproduction is by gametangial contact or gametangial conjugation
- f. Hyphae are septate with dolipore septa

- (1) Two (2) Three
- (3) Four (4) Five

131. Choose the **odd** one w.r.t. members of pyrophyta

- (1) *Gonyaulax* (2) *Noctiluca*
- (3) *Gymnodinium* (4) *Physarum*

132. Dinoflagellates show/are

- (1) Mainly parasitic
- (2) Responsible for toxic red tide that harm shell fishes
- (3) Bioluminescence
- (4) Monotrichous condition

133. Choose the **correct** option w.r.t. features of slime moulds showing similarity with fungi (F), plantae (P) and animalia (A) respectively

- a. Wall-less vegetative phase
- b. Fruiting bodies
- c. Mitospore formation
- d. Cellulosic cell wall

- (1) F(b, c), P(d), A(a) (2) F(a), P(b), A(c, d)
- (3) F(b), P(a, c), A(d) (4) F(b), P(c), A(a, d)

134. Identify the **correct** statement w.r.t saprophytic protists

- (1) The plasmodium differentiates & forms fruiting bodies under favourable conditions
- (2) The spores are dispersed by water & air currents
- (3) The plasmodium is formed under suitable conditions
- (4) The spores possess true walls but can survive only for few months

135. Mark the **incorrect** statement regarding fungi.

- (1) Some of the factors affecting growth of fungi are temperature, aeration and moisture
- (2) Fungi show great diversity in morphology and habitat
- (3) Fungi are more abundant in substrates with low sugar content and low temperature
- (4) Fungi are mainly terrestrial

Space for Rough Work



All India Aakash Test Series for Medical-2019

136. Bats differ from birds in that

- (1) Their skin is unique in possessing hair
- (2) Fertilisation is internal
- (3) They are homeothermal and endothermal
- (4) Endoskeleton is bony

137. Notochord in chordates is

A	B	C
---	---	---

- | | | |
|------------|------------|-----------------------|
| (1) Solid | Mesodermal | Ventral to nerve cord |
| (2) Hollow | Mesodermal | Ventral to nerve cord |
| (3) Hollow | Ectodermal | Dorsal to gut |
| (4) Solid | Ectodermal | Dorsal to nerve cord |

138. Which of the following fish possesses pelvic claspers?

- | | |
|----------------------|------------------------|
| (1) <i>Exocoetus</i> | (2) <i>Hippocampus</i> |
| (3) <i>Scoliodon</i> | (4) <i>Labeo</i> |

139. Which of the following is a secretion of exocrine gland?

- | | |
|-----------------|-------------|
| (1) Glucagon | (2) Insulin |
| (3) Aldosterone | (4) Mucus |

140. Tubular parts of nephron are lined by

- (1) Pseudostratified epithelium
- (2) Cuboidal epithelium
- (3) Columnar epithelium
- (4) Stratified non-Keratinised squamous epithelium

141. Parental care is seen in

- | | |
|-----------------------|------------------------|
| a. <i>Bufo</i> | b. <i>Hemidactylus</i> |
| c. <i>Hippocampus</i> | d. <i>Ichthyophis</i> |
| e. <i>Macropus</i> | |
| (1) Only a, c | (2) a, b & d |
| (3) c, d & e | (4) b, c & e |

142. Neuroglial cells exhibit

- | | |
|-------------------|-------------------|
| (1) Cell division | (2) Excitability |
| (3) Conductivity | (4) Extensibility |

143. Match the columns and choose the correct option w.r.t. epithelial tissue and location.

Column-I Epithelial tissue	Column-II Location
a. Cuboidal	(i) Epidermis of skin
b. Ciliated	(ii) Inner lining of blood vessels
c. Columnar	(iii) Lining of stomach and intestine
d. Squamous	(iv) Inner lining of fallopian tubes
e. Keratinised squamous	(v) Lining of pancreatic duct
(1) a(v), b(iv), c(iii), d(ii), e(i)	
(2) a(v), b(iii), c(ii), d(i), e(iv)	
(3) a(iv), b(v), c(iii), d(ii), e(i)	
(4) a(v), b(iii), c(iv), d(ii), e(i)	

144. Read the characteristics given below

- I. Fusiform in appearance
- II. Not under the control of our will
- III. Unbranched
- IV. Uninucleated

These can be found in

- (1) Unstriated, voluntary muscles
- (2) Visceral muscles
- (3) Striated voluntary muscles
- (4) Cardiac muscles

Space for Rough Work



145. Which of the following is the correct pairing of a body part and the kind of muscle tissue that moves it?

- (1) Biceps of upper arm – Striated, smooth muscle
- (2) Intestine – Involuntary, smooth muscle
- (3) Abdominal wall – Multinucleated, smooth muscle
- (4) Heart wall – Involuntary, unstriated muscle

146. What would happen to the joint if we cut ligaments present at a joint?

- (1) It will become freely movable
- (2) It will become fixed
- (3) The joint becomes unstable
- (4) It becomes slightly movable

147. What type of tissue is blood?

- (1) Loose connective tissue
- (2) Dense connective tissue
- (3) Areolar tissue
- (4) Specialised connective tissue

148. Choose the correct set of animals exhibiting direct development and presence of dicondylic skull.

- (1) *Ichthyophis*, *Hyla*, *Crocodilus*
- (2) *Balaenoptera*, *Ornithorhynchus*, *Pteropus*
- (3) *Delphinus*, *Aptenodytes*, *Nephron*
- (4) *Corvus*, *Struthio*, *Testudo*

149. *Chameleon* differs from *Calotes* in that

- (1) It is oviparous and development is direct
- (2) It is poikilothermal
- (3) It has prehensile tail
- (4) It shows shedding of mesodermal scales

150. In which of the following the genus name, its two characters and its class/phylum are correctly matched?

Genus	Two characters	Class/Phylum
(1) <i>Pristis</i>	(i) Skin is covered with cycloid/ctenoid scales. (ii) Air bladder present	Osteichthyes
(2) <i>Pteropus</i>	(i) Skin possess hair (ii) Aquatic	Mammalia
(3) <i>Salamandra</i>	(i) Tympanum represents ear (ii) Oviparity	Amphibia
(4) <i>Naja</i>	(i) Fertilisation internal (ii) Tympanum represents ear	Reptilia

151. Which of the following match is incorrect?

- (1) *Calotes* – Garden Lizard
- (2) *Chelone* – Tortoise
- (3) *Chameleon* – Tree Lizard
- (4) *Bangarus* – Krait

152. Choose wrong statement from the following :

- (1) Long bones in birds are pneumatic
- (2) Reptiles are poikilothermal
- (3) Air bladder in chondrichthyes regulates buoyancy
- (4) Air-sacs are avascular so are not involved in exchange of gases

Space for Rough Work



153. Which of the following features are present in chordates?

- (1) Dorsal heart, pharynx perforated by gill slits and dorsal nervous system
- (2) Ventral heart, the presence of post anal tail and paired pharyngeal gill-slits
- (3) Ventral heart, absence of post anal tail and presence of paired pharyngeal gill slits
- (4) Dorsal heart, notochord present and solid nervous system

154. Which of the following is **not** a key characteristic of fishes?

- (1) Vertebral column
- (2) Gills
- (3) Heart with one atria and one ventricle
- (4) Tympanic membrane

155. Which of the following statements is false?

- (1) Dense irregular connective tissue that has fibroblasts and many fibres that are oriented differently are present in skin
- (2) Compound epithelium covers the dry surface of the skin and has protective function
- (3) Epithelial tissue is rich in intercellular matrix and is vascular
- (4) Skin is connected to muscles by areolar connective tissue

156. The periosteum is a membrane that does which of the following?

- (1) Covers the bone
- (2) Contains marrow
- (3) Produces red blood cells
- (4) Increases the length of bones

157. Salivary glands are

- (1) Unicellular glands
- (2) Multicellular, endocrine glands
- (3) Unicellular, exocrine glands
- (4) Multicellular, exocrine glands

158. Given below are some vertebrates in a box.

Petromyzon, Salamandra, Exocoetus, Pristis, Clarias

Choose the **correct** class from the given options whose members are more than one in number in the given box.

- (1) Chondrichthyes
- (2) Osteichthyes
- (3) Cyclostomata
- (4) Amphibia

159. Complete the following analogy

Nerve : neuron :: cartilage :

- (1) Marrow
- (2) Skeleton
- (3) Osteocyte
- (4) Chondrocyte

160. Mark the false statement w.r.t. animal tissues.

- (1) Some of the columnar or cuboidal cells get specialised for secretion and form glandular epithelium
- (2) Exocrine glands secrete their secretions directly over epithelial surface without ducts
- (3) In epithelial tissues, specialised junctions provide structural and functional links between its individual cells
- (4) Chondrocytes are enclosed in small cavities (lacunae) present within the matrix

Space for Rough Work

161. Identify the given statements as true (T) or False (F).

- A. Tight junctions facilitate the cells to communicate with each other by connecting the plasma membranes of adjoining cells, for rapid transfer of ions, small molecules and sometimes bigger molecules.
- B. Simple epithelium covers the moist surface of buccal cavity, pharynx, muscle and lining of ducts of salivary glands.
- C. Cell junctions hold smooth muscle fibres and they are bundled together in a connective tissue sheath.
- D. Cartilage is present in tip of nose, limbs and hands in adults.

A	B	C	D
(1) F	F	T	F
(2) T	F	T	F
(3) F	F	T	T
(4) T	F	T	T

162. Find out the correct statement about neural tissue.

- (1) Arrival of the disturbance at the neuron's endings, triggers events that can cause only stimulation of adjacent neuroglial cells or neurons
- (2) Neuroglial cells make up more than one half of the volume of neural tissue in our body
- (3) When a neuroglial cell is suitably stimulated, an electrical disturbance is generated which swiftly travels along its plasma membrane
- (4) Oligodendrocytes form myelin sheath around nerve fibres of peripheral neural system

163. A set of connective tissue is

- (1) Areolar tissue, smooth muscles, adipose tissue
- (2) Ligament, Adipose tissue, Tendons
- (3) Cartilage, bone, skeletal muscles
- (4) Blood, smooth muscles, lymph

164. Choose the correct match of the name of animal in (Column-I) with one characteristic given in (Column-II) and the phylum/class in (Column-III) to which it belongs.

Column-I	Column-II	Column-III
(1) <i>Hippocampus</i>	Gill-slits are separate and covered by operculum	Chondrichthyes
(2) <i>Branchiostoma</i>	Notochord is present in larval tail	Urochordata
(3) <i>Pterophyllum</i>	Contains air bladder which regulates buoyancy	Osteichthyes
(4) <i>Ichthyophis</i>	Body covered by dry and cornified skin	Amphibia

165. Match the following columns.

Column-I	Column-II
a. These possess electric organs	(i) <i>Trygon</i>
b. Animals of this class are poikilothermal	(ii) Cyclostomata
c. These contain poison sting	(iii) <i>Torpedo</i>
d. All these migrate for spawning to fresh water	(iv) Chondrichthyes
	(v) <i>Petromyzon</i>
(1) a(i), b(iv), c(iii), d(ii)	
(2) a(iii), b(iv), c(i), d(ii)	
(3) a(iii), b(iv), c(i), d(v)	
(4) a(iv), b(iii), c(i), d(v)	

Space for Rough Work



166. Which of the following is the function of mast cells of areolar connective tissue?
- (1) They are phagocytic in nature
 - (2) They secrete maximum amount of the matrix
 - (3) They secrete fibres of structural proteins called collagen or elastin
 - (4) They secrete histamine, serotonin and heparin
167. Tendons differ from ligaments in that the tendons are
- (1) Dense regular connective tissue
 - (2) Composed of both elastic and collagen fibres
 - (3) Attach skeletal muscles to bones
 - (4) Attach one bone to another
168. Select the options which include **incorrect** statements w.r.t. simple epithelium.
- I. It lines body cavities, small ducts and alveoli of lungs
 - II. Found in the wall of blood vessels
 - III. It has protective function as it does in our skin
 - IV. Consists of two or more cell layers
- (1) III & IV only (2) I & III only
 - (3) I & IV only (4) II & III only
169. Hyaline cartilage is present in
- (1) Pubic symphysis (2) Ear pinna
 - (3) Eustachian tube (4) Nasal septum
170. Which of the following does **not** belong to chondrichthyes?
- (1) *Carcharodon* (2) *Pristis*
 - (3) *Scoliodon* (4) *Clarias*
171. Mark the odd one w.r.t. air sacs.
- (1) *Aptenodytes*
 - (2) *Neophron*
 - (3) *Pteropus*
 - (4) *Columba*
172. Earliest class of vertebrates exhibiting internal fertilization and homeothermy is
- (1) Amphibia
 - (2) Mammalia
 - (3) Reptilia
 - (4) Aves
173. Elongation of long bones occurs at/in
- (1) Epiphyseal plate, composed of bone cells
 - (2) Diaphysis, composed of bone cells
 - (3) Epiphyseal plate, composed of cartilage cells
 - (4) Red bone marrow
174. Read the statements 'A' & 'R', where 'R' is the reason given for the statement 'A'.
- A. *Petromyzon* is included in the division Agnatha.
R. It is a jawless vertebrate.
- Choose the **correct** option.
- (1) Statement and reason are true in themselves but the reason does not explain the statement
 - (2) Statement is true but the reason is false
 - (3) Both the statement and reason are true and reason explains the statement
 - (4) Statement is false but the reason is an accepted fact
175. Cartilage present at the tip of nose is
- (1) Hyaline (2) Calcified
 - (3) Elastic (4) White fibrous
176. *Torpedo* and *Trygon* differ from *Scoliodon* because
- (1) Their skin is tough containing minute placoid scales
 - (2) In males, pelvic fins possess claspers
 - (3) Their pectoral fins are not sharply demarcated from the body
 - (4) Their five pairs of gill slits are lateral in position

Space for Rough Work

177. Birds have reptilian ancestry, because

- (1) Birds possess scales on their hindlimbs
- (2) They show egg laying ability
- (3) They are able to maintain a constant body temperature
- (4) Fertilisation is internal

178. How will you distinguish *Ichthyophis* from *Rana*?

- (1) It is a tailless amphibian
- (2) It has two pairs of limbs. Body is divisible into head and trunk
- (3) It is a limbless amphibian
- (4) Heart is three chambered and it is a cold blooded animal

179. Which of the following statements is false about lancelet?

- (1) It is present exclusively in marine waters
- (2) The notochord extends from head to tail region and is persistent throughout their life
- (3) It is a vertebrate because it has a notochord
- (4) It is often referred to as protochordate

180. *Ornithorhynchus* differs from *Macropus* as it

- (1) Has external ears or pinnae
- (2) Is viviparous
- (3) Does not possess mammary glands
- (4) Lays eggs

□ □ □

Space for Rough Work

